

## ABSTRACT

The present invention constitutes a ring oscillator of an even number of stages of inverting/summing amplifiers and adds, to an input of each of the amplifiers, a signal from such one of the amplifiers as to be distant by an even number of stages therefrom, to realize a desired oscillation operation, thereby directly generating signals having phases shifted by 90 degrees from each other. Further, according to the present invention, the signals in the ring oscillator are complementary to each other, so that by arranging these signals close to each other in wiring, it is possible to realize low sensitivity to a mixed signal from an outside.